



## Book Review

# The Wildlife Techniques Manual, Eighth Edition

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The 8<sup>th</sup> edition of *The Wildlife Techniques Manual* (Fig. 1) is a welcome sight in today's information hungry world. Since 1960, The Wildlife Society has produced several editions of techniques manuals that started off fairly modest, but now, in 2020, have grown into a monstrous, two-volume set (Fig. 2).

The chapters in the new manual are divided into two major categories: Research (Volume 1) and Management (Volume 2). The research volume is sub-divided into several sections, including Design and Analytical Techniques (7 chapters), Identification and Marking Techniques (4 chapters), Measuring Animal Abundance (7 chapters), Measuring Wildlife Habitat (4 chapters), and Research on Individual Animals (3 chapters). The management volume is divided into three sections: Management Perspectives (6 chapters), Managing Landscapes for Wildlife (12 chapters), and Managing Wildlife Populations (7 chapters). See the **Appendix** for a complete list of chapter titles and authors.

The 7<sup>th</sup> edition, which I reviewed in 2012 (Clark 2012), was the first time that the manual was published as a two volume set. The 8<sup>th</sup> edition continues this trend, but adds several new chapters; the 7<sup>th</sup> edition only had 37 chapters and the new edition has now grown to 50 chapters. As I predicted in 2012, the 8<sup>th</sup> edition reflects new challenges and research frontiers as wildlife managers and biologists invent new ways to study wildlife questions.

One of the most exciting and innovative approaches is explored in chapter 17: *Use of Unmanned Aerial Vehicles in Wildlife Ecology* (Rosario et al. 2020). The use of unmanned “drones” has exploded on the wildlife scene over the past few years. Drones are useful in capturing data on research subjects difficult to access via foot or vehicle. But one major caveat in using these drones is the Federal



**Fig. 1.** *The Wildlife Techniques Manual*, 2 Volumes. Editor, Silvy NJ. The Johns Hopkins University Press, Baltimore, Maryland, USA. 8<sup>th</sup> Edition, published 28 July 2020.

Trim Size: 8.5” × 11” | 1400 pages | Illustrations: 260 halftones, 165 line drawings | ISBN: 9781421436692 | Hardcover: US \$174.95. *Photo by Howard Clark.*

Aviation Administration's (FAA) Unmanned Aerial Vehicle (UAV) licensing and flight regulations. Safety is paramount when using drones and it is imperative that when using drones, wildlife managers and researchers understand the latest laws, directives, and policies. With a high level of FAA regulation understanding, better conservation of biological resources will result as well as an enriched research deliverable. The chapter covers several other topics, including types of UAV platforms and considerations, data management and analysis, UAVs in wildlife ecological research, and UAV safety. I was pleased to see a chapter on drones added to the 8<sup>th</sup>

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**Fig. 2.** *The Wildlife Techniques Manual* (8<sup>th</sup> edition, 2 volumes) compared to the slender 1<sup>st</sup> edition published 60 years earlier (Mosby 1960), which has 17 chapters. *Photo by Howard Clark.*

edition and I am sure as drone technology improves a chapter on UAVs continue to appear in future editions.

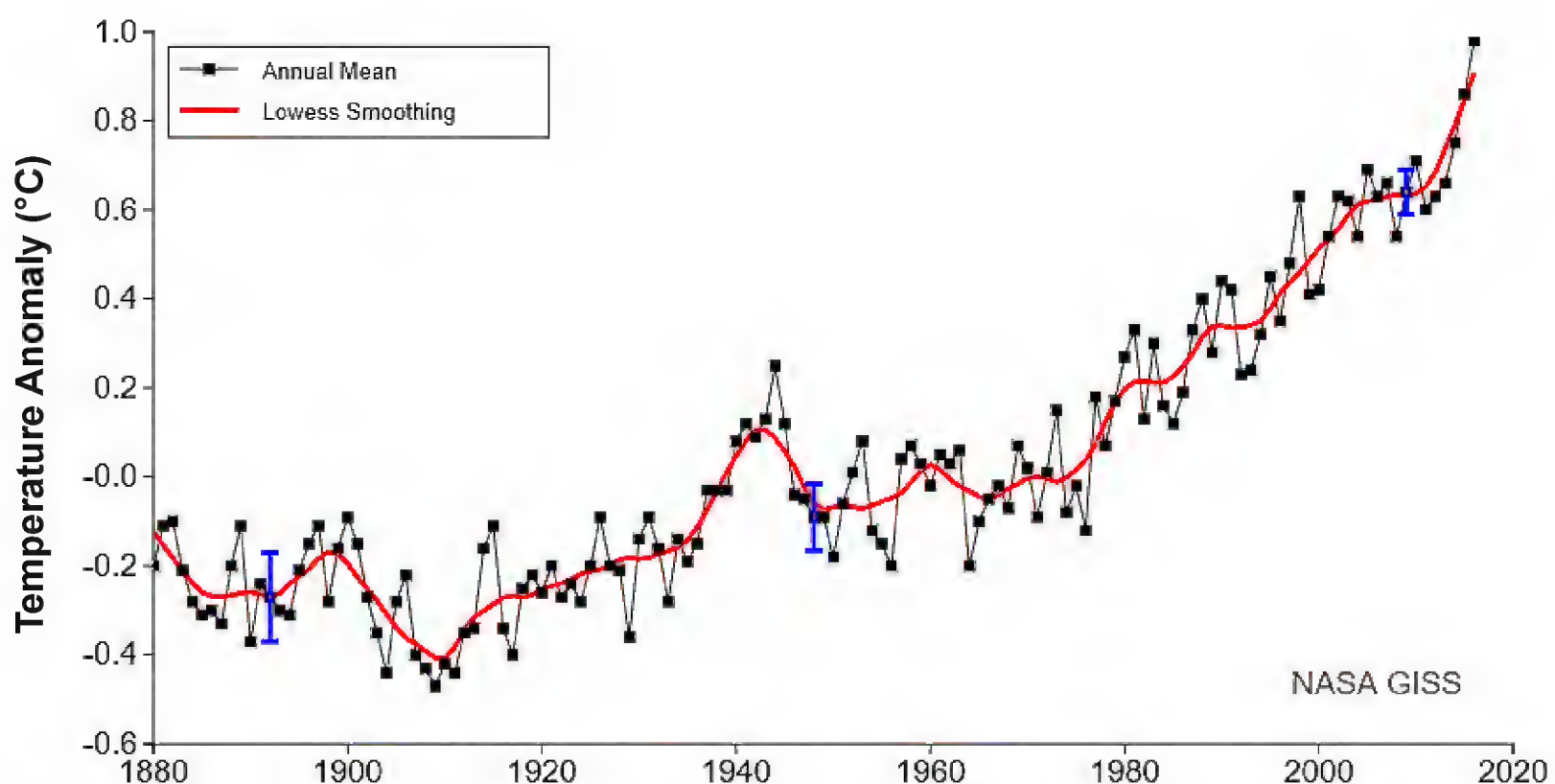
The final chapter, Chapter 50, *Managing Wildlife in a Changing Climate* (Inkley and Stein 2020), really binds all the others together. Although climate change (formerly known as “global warming”) has been on the scientific radar for decades (e.g., Chamberlin 1899) only now has a chapter in the manual been devoted to it. All of the research techniques and management philosophies discussed at length in *The Wildlife Techniques Manual* will be conducted under the auspices of global climate change. The trends of increased change in global temperatures (Fig. 3) have a significant effect on the global landscape and the wildlife species that occupy it. Research conducted from now on will no doubt have climate change as a factor, or at least something running in the background driving evolution and environmental adaptation. Chapter 50 provides an excellent overview and summary of the effects of climate change on wildlife. As the authors state on page 443, “The scientific record conclusively demonstrates that impacts of climate

change on wildlife are not just a concern for the distant future, but already are happening.” Climate effects are physically visible, such as the 17 of the 18 hottest years in the 136-year record have all occurred since 2001. We are witnessing catastrophic wildfires, hurricanes, droughts, and other extreme (but increasingly frequent) weather events. As noted in recent news media, the droughts in the western USA have driven beetle-kills of trees in western coniferous forests, which exacerbate the wildfire season. The “cause and effect” and interconnectedness of global climate change and landscape impacts are alarming.

In addition, Chapter 50 covers climate change basics, such as climate versus weather, climate models, scenarios of greenhouse gas concentrations, and best practices for the use of climate projections. An important section of the chapter covers abiotic and physical climate impacts, with discussions on elevated carbon dioxide levels, temperature changes, precipitation changes, intensified hurricanes and storms, snow cover changes, permafrost melting, declines in ice cover and glaciers, sea-level rise, ocean temperature increases, and ocean acidification. These sections paint a bleak picture, but subsequent sections provide approaches to mitigate the pending deleterious trends. The authors explore four overarching principles for effective climate adaptation:

1. Act with intentionality; link actions to climate impacts.
2. Manage for change, not just persistence.
3. Reconsider goals, not just strategies.
4. Integrate adaptation into existing work.

There are various things that we can do to respond to climate change, such as developments in wind energy and biofuel, changes in agricultural practices, shifting human population centers and infrastructure, and coastal armoring.



**Fig. 3.** Global temperature trends 1880–2017. Global mean estimates based on land and ocean data. <https://data.giss.nasa.gov/gistemp/graphs/>. *Graphic in the Public Domain.*

Chapter 50 is key in understanding global climate change and how we, as a species, can address and mitigate it. The authors state on page 468, “The future of our wildlife depends on wildlife professionals incorporating climate considerations into all aspects of their work.”

Overall, *The Wildlife Techniques Manual* is a critically important tool in the continued management and conservation of wildlife and landscape habitats. I encourage biologists and wildlife managers to field test the recommendations and guidance provided by the many authors who contributed to these monumental volumes. By working together, and using sound science, we may be able to create a sustainable global community on every level, launching us into a future of hope.

**Acknowledgments.**—I thank C.J. Randel and N.J. Silvy for allowing me to be a voice and participate in this extraordinary work. I am also incredibly grateful for the Johns Hopkins University Press production team and their collaboration effort with The Wildlife Society.

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**Appendix.** *The Wildlife Techniques Manual* (8<sup>th</sup> edition, 2 volumes) list of chapters and authors.

<b>Volume 1. Research</b>		
<i>List of Contributors</i>		
<i>Preface</i>		
<i>Acknowledgments</i>		
<b>Design and Analytical Techniques</b>		
Chapter 1	Research and Experimental Design	EO Garton, JL Aycrigg, C Conway, and JS Horne
Chapter 2	Management and Analysis of Wildlife Ecology Data	BA Collier and TW Schwertner
	Capturing and Handling Techniques	
Chapter 3	Capturing and Handling Wild Animals	NJ Silvy, RR Lopez, and TA Catanach
Chapter 4	Chemical Immobilization of Wildlife	ML Drew
Chapter 5	Use of Dogs in Wildlife Research and Management	DK Dahlgren, RD Elmore, DA (Smith) Woollett, A Hurt, JK Young, D Kinka, EB Arnett, D Baines, and JW Connelly
Chapter 6	Identifying and Handling Contaminant-Related Wildlife Mortality/Morbidity	SR Sheffield, JP Sullivan, and EF Hill
Chapter 7	Wildlife Health and Disease Surveillance, Investigation, and Management	MJ Peterson and PJ Ferro
<b>Identification and Marking Techniques</b>		
Chapter 8	Criteria for Sex and Age of Birds and Mammals	EK Lyons, MA Schroeder, and LA Robb
Chapter 9	Identification of Animals from Field Signs	JM Tomeček and J Evans
Chapter 10	Techniques of Marking Wildlife	NJ Silvy, RR Lopez, and MJ Peterson
Chapter 11	Radiotelemetry, Remote Monitoring, and Data Analyses	NJ Silvy and TA Catanach
<b>Measuring Animal Abundance</b>		
Chapter 12	Estimating Animal Abundance	BL Pierce, RR Lopez, and NJ Silvy
Chapter 13	Use of Remote Cameras in Wildlife Ecology	ID Parker, RR Lopez, and SL Locke
Chapter 14	Population Analysis in Wildlife Ecology	DH Johnson and SJ Dinsmore
Chapter 15	Use of Bioacoustics Monitoring Systems in Wildlife Research	JM Szewczak and ML Morrison
Chapter 16	Tracking Wildlife with Radar Techniques	TA Catanach and NJ Silvy
Chapter 17	Use of Unmanned Aerial Vehicles in Wildlife Ecology	RG Rosario, MK Clayton, and IT Gates
Chapter 18	Invertebrate Sampling Methods for Use in Wildlife Research	TA Catanach

**Appendix (continued).** *The Wildlife Techniques Manual* (8<sup>th</sup> edition, 2 volumes) list of chapters and authors.

<b>Measuring Wildlife Habitat</b>		
Chapter 19	Vegetation Sampling and Measurement	KF Higgins, KJ Jenkins, DW Uresk, LB Perkins, KC Jensen, JE Norland, RW Klaver, and DE Naugle
Chapter 20	Techniques for Wildlife Nutritional Ecology	LA Shipley, RC Cook, and DG Hewitt
Chapter 21	Simulation Modeling in Wildlife Research	H-H (Rose) Wang and WE Grant
Chapter 22	Using Geospatial Technologies in Wildlife Studies	HL Perotto-Baldivieso, S Tapaneeyakul, and ZJ Pearson
<b>Research on Individual Animals</b>		
Chapter 23	Animal Behavior	JR Young
Chapter 24	Reproduction and Hormones	HM Bryan and JD Harder
Chapter 25	Conservation Genetics and Molecular Ecology in Wildlife Management	SJ Oyler-McCance, EK Latch, and PL Leberg
<i>Common and Scientific Names of Animals and Plants</i>		
<i>Literature Cited</i>		
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<b>Volume 2. Management</b>		
<i>List of Contributors</i>		
<i>Acknowledgments</i>		
<b>Management Perspectives</b>		
Chapter 26	Strengthening Connections between Research and Management	LA Brennan, SJ Demaso, JP Sands, and MJ Schnupp
Chapter 27	Ethics in Wildlife Science and Conservation	MJ Peterson, MN Peterson, TR Peterson, and E von Essen
Chapter 28	Human Dimensions of Wildlife Management	SL Rodriguez and MN Peterson
Chapter 29	Communications and Outreach	SK Jacobson, HO Brown, and BS Lowe
Chapter 30	Conflict in Wildlife Science and Conservation	AM Feldpausch-Parker and TR Peterson
Chapter 31	Adaptive Management in Wildlife Conservation	JF Organ, DJ Decker, SJ Riley, JE McDonald, Jr., and SP Mahoney
<b>Managing Landscapes for Wildlife</b>		
Chapter 32	Forest Management for Wildlife	SW Bigelow, CG Mahan, AD Rodewald, LM Conner, and LL Smith
Chapter 33	Managing Rangelands for Wildlife	VC Bleich, MW Oehler, and JG Kie
Chapter 34	Managing Inland Wetlands for Wildlife	MK Laubhan, SL King, and LH Fredrickson
Chapter 35	Management of Coastal Wetlands for Wildlife	JA Nyman, C Elphick, and G Shriver
Chapter 36	Managing Farmlands for Wildlife	RE Warner, JW Walk, and JR Herkert
Chapter 37	Management and Research of Wildlife in Urban Environments	RA McCleery, CE Moorman, MC Wallace, and D Drake
Chapter 38	Managing Surface Disturbed Lands for Wildlife	TA Catanach and NJ Silvy
Chapter 39	Managing Disturbances to Wildlife and Habitats	CJ Parent, F Hernandez, and A Bruno
Chapter 40	Managing State Lands for Wildlife	TJ Ryder and JF Organ
Chapter 41	Managing Federal Lands for Wildlife	B Beard, RP Bixler, T Darden, B Huffaker, M Madison, and JG Van Ness
Chapter 42	Managing North American Indigenous Peoples' Wildlife Resources	H Stricker, PM Schmidt, J Gilbert, J Dau, DL Doan-Crider, S Hoagland, MT Kohl, CA Perez, LJ Van Daele, MB Van Daele, and D Dupont
Chapter 43	The Role of Nongovernment Organizations in Wildlife Management	HA Mathewson, JJ Giocomo, and SP Riley
<b>Managing Wildlife Populations</b>		
Chapter 44	Harvest Management	JW Connelly, JH Gammonley, and TW Keegan
Chapter 45	Identification and Management of Wildlife Damage	KC Vercauteren, RA Dolbeer, AB Shiels, and EM Gese
Chapter 46	Managing Terrestrial Invasive Species	TE Fulbright and TA Campbell
Chapter 47	Ecology and Management of Small Populations	JS Horne, LS Mills, JM Scott, KM Strickler, and SA Temple
Chapter 48	Captive Propagation and Translocation	D Drake and SA Temple
Chapter 49	Environmental Impact Assessment and Habitat Conservation Plans	CJ Randel, III, HO Clark, Jr., DP Newman, and TP Dixon
Chapter 50	Managing Wildlife in a Changing Climate	DB Inkley and BA Stein
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<i>Literature Cited</i>		
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